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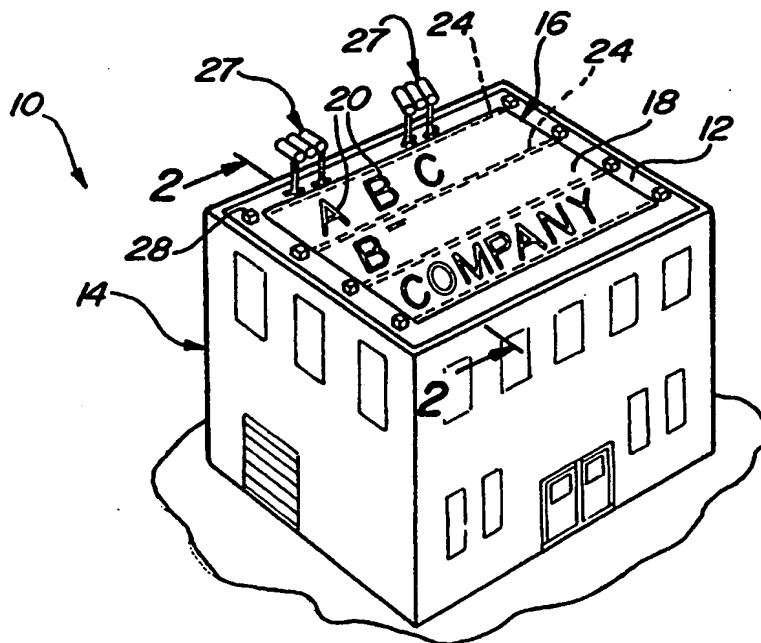
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US96/07996 (22) International Filing Date: 30 May 1996 (30.05.96) (30) Priority Data: 08/452,897 30 May 1995 (30.05.95) US (60) Parent Application or Grant (63) Related by Continuation US Not furnished (CON) Filed on Not furnished (71)(72) Applicant and Inventor: VESTEVICH, Jacqueline, K. [US/US]; 4751 Sandpiper Lane, West Bloomfield, MI 48323 (US). (74) Agents: CARLSON, John, E. et al.; Howard & Howard, Suite 101, 1400 North Woodward Avenue, Bloomfield Hills, MI 48304 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>With amended claims.</i>

(54) Title: PORTABLE ROOFTOP SIGN

(57) Abstract

A portable rooftop sign includes a large flexible mesh sheet (16) having a plurality of characters or logos (20) disposed on an upper surface. A plurality of sleeves (24) are attached to a lower surface of the sheet. The sign is installed on a generally planar roof (12) of a building (14) near an airport. Elongated weights or rods (28) are slidably inserted into each of the sleeves to secure the flexible sheet to the roof. Each of the elongated weights comprises a plurality of rod sections (31) which are removably connected by threaded ends. Portable light source (27) on the roof illuminate the sign at night or in low visibility. In colder climates, electric heating elements (38) embedded in the sheet prevent snow and ice accumulation by melting the snow and ice, which then drains through the mesh sheet and is removed by the normal drainage of the roof.



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PORTABLE ROOFTOP SIGN

BACKGROUND OF THE INVENTION

The present invention relates to a portable rooftop sign which is visible from aircraft.

5 Advertisers have attempted to cash in on the increasing number of people travelling around and through major airports. Billboards line the highways around the airport and indoor advertising signs abound within the airport buildings themselves. With the tremendous amount of competition in the outdoor advertising arena, advertising agencies and companies have expanded the media into new
10 innovative forums, including advertising signs on airport baggage carousels, signs inset into grocery store floor tiles and on grocery conveyor belts and even a proposed orbiting environmental billboard, an inflatable advertising sign the size of more than 100 football fields, that will orbit the earth.

Because of urban growth and increased aircraft traffic, area airports have
15 attempted to reduce noise-related complaints from local residents by altering flight paths to pass over non-residential areas. As a result, most landings and take-offs are concentrated over a limited area. Further, the vast majority of flights take place during daylight hours, specifically between 9:00 a.m. and 9:00 p.m.

A known airway sign, disclosed in U.S. Patent No. 1,866,199, utilizes large
20 rigid characters supported above the ground by framework consisting of a series of posts and horizontal brackets and rails. This sign includes many large, rigid heavy parts and is therefore not conveniently portable. Further, because the posts must be bolted down, the sign is not suitable for temporary use on a rooftop.

Another airway sign, disclosed in U.S. Patent No. 1,937,374, includes a large mat comprising a plurality of substantially vertically arranged cells which provide a light absorbing surface. Letters, numerals or other indicating means formed of sheet metal are placed on the mat. The letters are provided with a plurality of bosses which ensure that the letters will be reflective when viewed from various angles. However the mat is not portable. The mat is a permanent structure; it is even contemplated that it could be used as a landing surface for aircraft.

An aviation marker disclosed in United States Patent No. 1,847,739 provides individual characters or arrows each formed as a large permanent structure. Each character is formed of a plurality of parallel vertical plates intersected by a transverse row of vertical plates. The plates are suspended above a bottom surface to provide for the free discharge of water and snow. A plurality of lights on the bottom surface illuminate the plates to provide the appearance of a solid character when viewed at an angle. Each of these characters is a large heavy structure which would not be portable but would be permanently constructed on its intended location. These structures are not suitable for temporary or portable use on rooftops.

An aeronautical roof sign disclosed in United States Patent 1,933,878 provides a permanent rooftop sign visible from aircraft. Characters are formed on a rooftop using gravel, crushed rock or slate of a color contrasting with those used to form the background. In this way, the sign or symbol is formed in the normal operation of building up a roof. Obviously this rooftop sign is not portable and the design cannot be changed without replacing the roof.

SUMMARY OF THE INVENTION

The present invention provides a portable rooftop sign including a large flexible mesh sheet having indicia such as characters and/or logos on its upper surface. The sign is installed on the roof of a building near the flight path of landing or departing aircraft to provide advertising messages which are visible to arriving and departing passengers.

In one embodiment, the sheet includes a plurality of parallel sleeves formed on its lower surface. Elongated weights are inserted into the sleeves to secure the sign to the top of an industrial building roof. The elongated weights each comprise a plurality of rod sections, which can be threadably joined or removably joined by other suitable means. In windier climates, additional weights can be detachably secured to the protruding ends of the elongated weights. Light sources on the roof illuminate the sign at night and at times of low visibility. In areas where snowfall is expected, electric heating elements can be embedded in the sheet to melt the snow.

The right to use building roofs can be negotiated with the building owners who, in exchange for monthly fees based on income from advertisers, will grant an easement for access to install, maintain and remove signs. Because the sign is portable, the sign can be removed from the roof after a negotiated term of advertisement or moved to another building. Because the sign is secured by weights, there is no damage to the roof from bolts or posts. Further, the mesh material of the flexible sheet ensures that the sign will not interfere with the drainage of water from the roof.

BRIEF DESCRIPTION OF THE DRAWINGS

The above, as well as other advantages of the present invention, will become readily apparent to those skilled in the art from the following detailed description of a preferred embodiment when considered in the light of the accompanying drawings in which:

Figure 1 is a perspective view of the portable rooftop sign installed on the roof of a building.

Figure 2 is a cross-sectional view of the portable rooftop sign of Figure 1.

Figure 3 is a partially exploded view of the portable rooftop sign of Figure

10 1.

Figure 4 is an enlarged view of the area 4 of Figure 3.

Figure 5 is a plan view of an another embodiment of the portable rooftop sign.

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DETAILED DESCRIPTION OF THE INVENTION

Referring to Figure 1, a portable rooftop sign 10 in accordance with the present invention is shown installed on a generally horizontal planar roof 12 of a building 14. The building 14 is preferably for commercial or industrial use and is preferably located near an airport in the designated flight paths for airplane take-offs or landings. Although flight paths of each airport vary, it is anticipated that buildings within five miles of the runways of the airport will provide a suitable location.

The sign 10 includes a large, flexible sheet 16 which is preferably nylon or plastic mesh material. The sheet can be rectangular or can have a communicative shape such as a silhouette, logo or character. Vinyl coated mesh is a commercially available suitable material which includes a polyester, nylon or other plastic which is coated with vinyl for wear and weather resistance. The sheet 16 is preferably at least 40 feet by at least 60 feet. The sheet 16 includes an upper surface 18 having indicia 20 dyed, silk-screened or painted onto the sheet. Alternatively, indicia made of nylon or plastic mesh formed in the shape of characters or logos can be sewn, fixed by adhesive or removably secured to the sheet 16. The color of the indicia 20 should be selected to provide high contrast with the color of the sheet 16. In order to be clearly visible from the air, the indicia 20 should be very large, preferably at least twelve feet high.

The sheet 16 has a lower surface (not shown) opposite the upper surface 18. A series of generally parallel sleeves 24 (shown in phantom) are formed in the lower surface and extend completely across the sheet 16. The sleeves 24 can be sewn, fixed by adhesive, or otherwise attached to or made part of the sheet 16. The portable rooftop sign 10 preferably includes a plurality of portable light sources 27 for illuminating the indicia 20 on the sheet 16 at night or in low visibility. The portable rooftop sign 10 may include optional end weights 28, if necessary, to secure the sheet 16 to the roof 12 in windier climates.

As can be seen in Figure 2, the roof 12 of the building 14 is preferably generally flat and includes a layer of gravel 29 or crushed stone. Typical roofs 12 of this type also generally have a slight pitch to provide for the drainage of water.

An elongated weight 30 inserted into each sleeve 24 secures the sheet 16 to the roof 12 without permanently damaging the roof 12 with holes for bolts or posts.

As can be seen in Figure 3, each of the elongated weights 30 comprises a series of rod sections 31, each having a male threaded end 32 and a female threaded end 33. Alternatively, the rod sections 31 may be telescoped or may include snap-fit or other suitable means for removably joining adjacent rod sections 31. The rod sections 31 can be aluminum or other suitable material which will provide sufficient mass to secure the sign 10. The rod sections 31 can be solid or hollow. If hollow rod section 31 are used, additional weight can be added, if necessary, by inserting short, cylindrical, solid iron billets 34 into the ends 32, 33 of the outer rod sections 31. Alternatively, sand or other suitable material can be poured or blown into the ends of the rod sections 31.

In windier climates, it may be desirable to include additional end weights 28 on the protruding ends of the elongated weights 30. The end weights 28 can include an arcuate recess 34 which receives a free end of a rod section 31. Further, the end weights 28 can include metal plates 35, which are attached to the end weights 28 by screws 36 or other suitable means to provide additional mass. It should be apparent that other forms of end weights such as sand bags could also be used.

Referring to Figure 4, the sheet 16 preferably includes a plurality of small apertures 37 for the drainage of water. For installations in colder climates, the sign 10 can include a plurality of parallel, low-voltage, electric heating elements 38 embedded in or secured to the sheet 16 in order to melt snow from the sign.

In another embodiment of the present invention, shown in Figure 5, the portable rooftop sign 40 includes a sheet 42 having a first pair of sleeves 43 and a second pair of sleeves 44, each pair formed along opposite edges of the sheet 42. The rod sections 31 are inserted into the sleeves 43, 44 and joined to form the elongated weights 30. The additional elongated weights 30 in the horizontal sleeves 43 may provide sufficient mass to eliminate the need to use any additional weights.

The portable rooftop sign 10 according to the present invention provides a lightweight sign which is visible from aircraft during landing or takeoff. The sheet 16 is provided with indicia 20 and sleeves 24 at an off-site location and transported to the roof 12 for installation. The sheet 16 is made of lightweight material and can be folded or rolled and easily transported to a building 14 which is near an airport and in or near the flight path of landing or departing airplanes. The sheet 16 is unrolled or unfolded on the roof 12 of the building 14 and the rod sections 31 are inserted one at a time into the sleeves 24. Each rod section 31 is threaded or otherwise secured to the preceding rod section 31 and then inserted into the sleeve 24. Preferably, the sign is oriented so that the elongated weights 30 are parallel to the direction of water drainage. This will further ensure that the sign 10 does not interfere with the drainage of water from the roof 12. Portable light sources 27 are preferably set up on the roof 12 and directed to illuminate the sign 10.

During display, the portable rooftop sign 10 is visible from aircraft landing or taking off from a nearby airport. At night or other times of low visibility, light sources 27 controlled by timers or photoelectric cells illuminate the sign 10. Because the sign 10 includes a plurality of apertures 37, rainwater can drain through

the sheet 16 and onto the gravel roof 12. The water drains according to the natural pitch of the roof 12 through the gravel 29. In colder climates, the heating elements 38 will melt snow from the sheet 16 and allow the water to drain off of the roof 12 normally, thereby keeping the upper surface 18 clear.

5 When the sign 10 is eventually dismantled, the rod sections 31 can be removed by sliding out each rod section 31 from the sleeve 24 and detaching it from the adjacent rod section 31. Because the elongated weights 30 must extend across the entire sign 10, which is preferably more than 60 feet, it is necessary to form the weights 30 of a plurality of manageable rod sections 31, preferably ten feet or less.

10 In removing the secured adjacent rod sections 31, the user can pull each rod section 31 out of the sleeves 24 one at a time and detach it from the adjacent rod section 31. After removing the elongated weights 30, the sheet 16 can be folded or rolled and removed from the roof 12. The sign 10 can be replaced with a sign having a different advertisement or can be moved to another building.

15 In accordance with the provisions of the patent statutes, the present invention has been described in what is considered to represent its preferred embodiment. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its spirit or scope.

WHAT IS CLAIMED IS:

1. A portable rooftop sign for installation on a generally horizontal planar roof of a building to be visible from aircraft flying near the building comprising:
 - 5 a flexible sheet having an upper surface and an opposite lower surface;
 - a plurality of sleeves formed on said flexible sheet; and
 - a plurality of elongated weights slidably disposed within said sleeves.
2. The portable rooftop sign according to claim 1 further including
10 communicative indicia disposed on said upper surface.
3. The portable rooftop sign according to claim 1 wherein said flexible sheet is plastic.
4. The portable rooftop sign according to claim 3 wherein said flexible sheet includes a plurality of apertures for draining water through the sheet.
- 15 5. The portable rooftop sign according to claim 4 wherein said flexible sheet is vinyl-coated mesh.
6. The portable rooftop sign according to claim 1 wherein each of said elongated weights comprises a plurality of rod sections, said rod sections being joinable to adjacent rod sections.
- 20 7. The portable rooftop sign according to claim 1 wherein said flexible sheet includes a plurality of heating elements.

8. A method for installing a portable rooftop sign visible from aircraft including the steps of:

- providing a flexible sheet having an upper surface and an opposite lower surface;
- 5 attaching sleeves generally the length of said flexible sheet to said lower surface of said sheet;
- selecting a building visible from landing or departing aircraft, said building having a generally planar roof;
- placing said flexible sheet on said roof of said building; and
- 10 sliding elongated weights into said sleeves.

9. The method according to claim 8 further including the step of securing communicative indicia to said upper surface of said flexible sheet.

10. The method according to claim 9 further including the step of forming said communicative indicia from a flexible material.

15 11. The method according to claim 9 further including the step of painting communicative indicia on said flexible sheet.

12. The method according to claim 8 wherein said flexible sheet is plastic mesh.

20 13. The method according to claim 8 wherein said elongated weights each comprise a plurality of rod sections, said rod sections being joinable to each other, said method further including the steps of joining said rod sections as said rod sections are inserted into said sleeves.

14. The method according to claim 8 further including the step of placing an end weight on protruding ends of said elongated weights.

15. The method according to claim 8 wherein said elongated weights are hollow, further including the step of inserting billets into the ends of said elongated
5 weights.

16. The method according to claim 8 further including the step of attaching heating elements to said flexible sheet.

17. The portable rooftop sign according to claim 8 wherein said sleeves are parallel to one another, further including the step of orienting the sleeves to run
10 generally parallel to the slope of said roof.

18. A portable rooftop sign for installation on a generally horizontal planar roof of a building to be visible from aircraft flying near the building comprising:

5 a flexible mesh sheet having an upper surface and an opposite lower surface;

communicative indicia disposed on said upper surface;

a plurality of heating elements attached to said flexible sheet;

a plurality of sleeves formed on said lower surface; and

10 a plurality of joinable rod sections slidably disposed within said sleeves, said rod sections being joined to form elongated weights.

AMENDED CLAIMS

[received by the International Bureau on 12 August 1996 (12.08.96);
original claims 2,9 and 18 cancelled; original claims 1,8,10,11,
13 and 15 - 17 amended; new claims 19 - 23 added;
remaining claims unchanged (5 pages)].

1. A portable rooftop sign for installation on a generally horizontal planar roof of a building to be visible from a location of higher elevation than the roof near the building comprising:
 - a flexible sheet having an upper surface and an opposite lower surface;
 - communicative indicia disposed on said upper surface;
 - a plurality of sleeves formed on said flexible sheet; and
 - a plurality of elongated weights slidably disposed within said sleeves, said flexible sheet disposed on said roof generally parallel to said roof such that said lower surface of said sheet abuts said roof, said communicative indicia visible from a location of higher elevation than the roof.
2. Cancelled
3. The portable rooftop sign according to claim 1 wherein said flexible sheet is plastic.
4. The portable rooftop sign according to claim 3 wherein said flexible sheet includes a plurality of apertures for draining water through the sheet.
5. The portable rooftop sign according to claim 4 wherein said flexible sheet is vinyl-coated mesh.
6. The portable rooftop sign according to claim 1 wherein each of said elongated weights comprises a plurality of rod sections, said rod sections being joinable to adjacent rod sections.
7. The portable rooftop sign according to claim 1 wherein said flexible sheet includes a plurality of heating elements.

8. A method for installing a portable rooftop sign visible from aircraft including the steps of:

- a) providing a flexible sheet having an upper surface and an opposite lower surface;
- b) attaching a plurality of sleeves to said sheet;
- c) forming communicative indicia on said upper surface of said flexible sheet;
- d) selecting a building visible from landing or departing aircraft, said building having a generally planar roof;
- e) placing said flexible sheet on said roof of said building generally parallel to said roof such that said lower surface abuts said roof; and
- f) sliding elongated weights into said sleeves after step e).

9. Cancelled

10. The method according to claim 8 further including the step of forming said communicative indicia from a flexible material.

11. The method according to claim 8 further including the step of painting communicative indicia on said flexible sheet.

12. The method according to claim 8 wherein said flexible sheet is plastic mesh.

13. The method according to claim 8 wherein said elongated weights each comprise a plurality of rod sections, said rod sections being joinable to each other, said step e) further including the sub-steps of:

- g) inserting a first rod section into one of said sleeves;
- h) securing a second rod section to said first rod section after step g);
- i) inserting said second rod section into said one of said sleeves of said sleeves after step h).

14. The method according to claim 8 further including the step of placing an end weight on protruding ends of said elongated weights.

15. The method according to claim 8 wherein said elongated weights are hollow, further including the step of inserting additional weight into the ends of said elongated weights.

16. The method according to claim 8 further including the step of attaching heating elements to said flexible sheet.

17. The method according to claim 8 wherein said sleeves are parallel to one another, said roof having a slope, said method further including the step of orienting the sleeves to run generally parallel to the direction of water drainage due to the slope of the roof.

18. Cancelled

19. A method for installing a sign on a generally planar generally horizontal first surface to be visible from a location elevated above said first surface including the steps of:
- a) providing a flexible sheet having an upper surface and an opposite lower surface;
 - b) attaching a plurality of sleeves to said sheet;
 - c) forming communicative indicia on said upper surface of said flexible sheet;
 - d) selecting a generally planar generally horizontal first surface generally visible from a location elevated above said first surface;
 - e) placing said flexible sheet on said first surface generally parallel to said first surface such that said lower surface abuts said first surface; and
 - f) sliding elongated weights into said sleeves after step e).

20. The method according to claim 19 wherein said elongated weights each comprise a plurality of rod sections, said rod sections being joinable to each other, step e) further including the sub-steps of:

- g) inserting a first rod section into one of said sleeves;
- h) securing a second rod section to said first rod section after step g);
- i) inserting said second rod section into said one of said sleeves of said sleeves after step h).

21. The portable rooftop sign according to claim 1 wherein said building is generally near an airport, such that said sign is visible from arriving or departing aircraft.

22. The portable rooftop sign according to claim 1 wherein said sleeves are formed about substantially the entire perimeter of said sheet.

23. The portable rooftop sign according to claim 1 wherein said elongated weights are rigid rods.

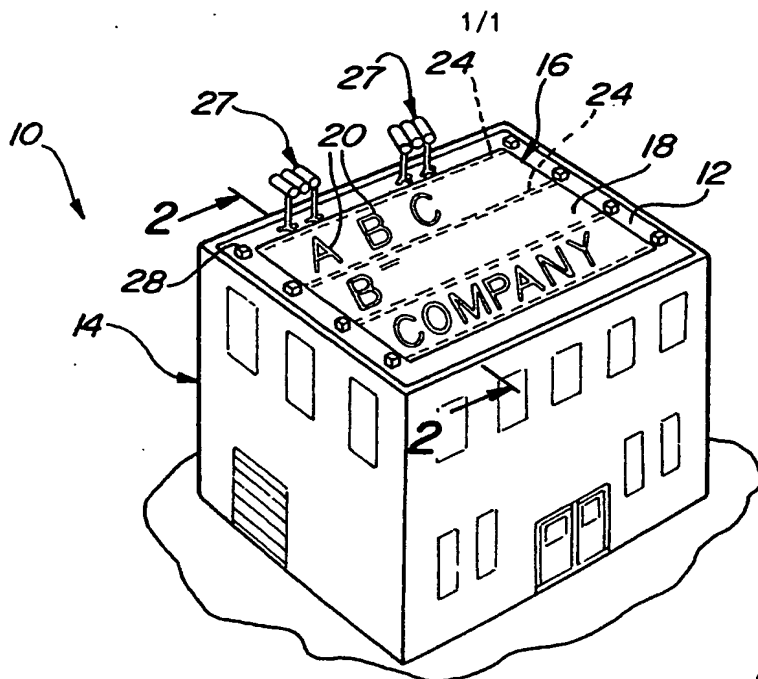


Fig-1

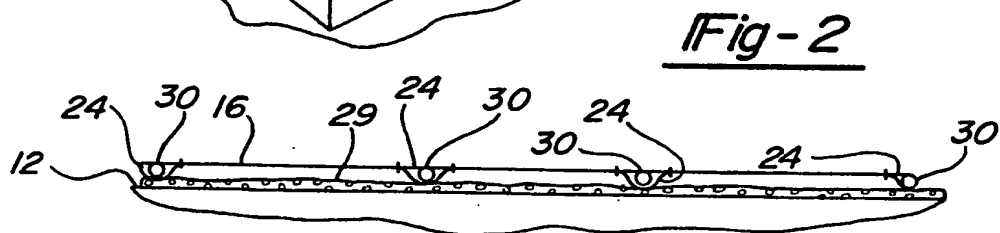


Fig-2

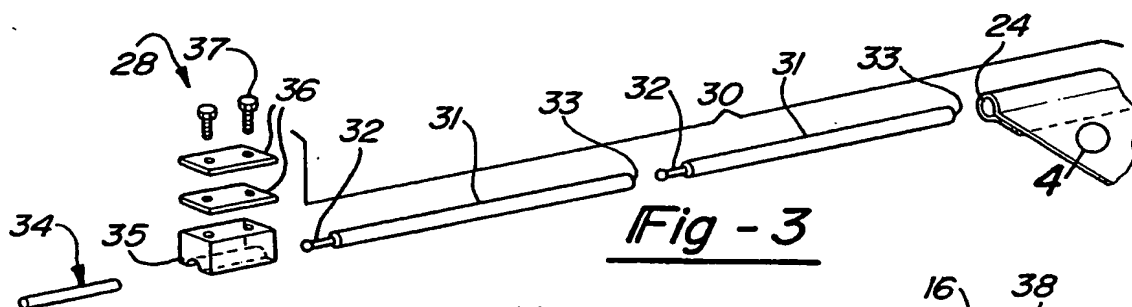


Fig-3

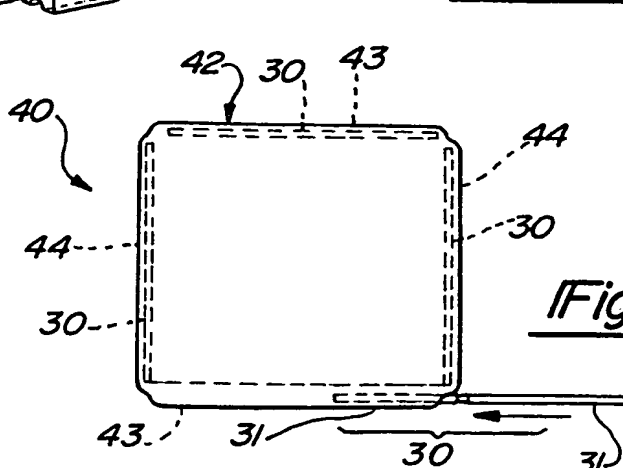


Fig-5

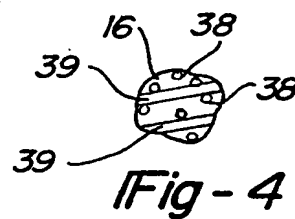


Fig-4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US96/07996

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G09F 21/06

US CL : 40/217

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 40/217, 602, 603, 604, 560; 52/38, 63, 105, 173.1, 173.3, 222

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US, A, 3,089,268 (FREY ET AL) 14 May 1963, col. 3 line 14-col. 4 line 41.	1, 2, 6, 8-11, 13-15, 17 ----- 3-5, 7, 12, 16, 18
Y	US, A, 4,019,271 (LATIMER) 26 April 1977, col. 8 lines 13-30.	3-5, 12
Y	US, A, 4,261,417 (TINGLEY) 14 April 1981, col. 2 line 17 - col. 3 line 47.	7, 16, 18

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search

02 JULY 1996

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30 July 1996 (30.07.96)

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